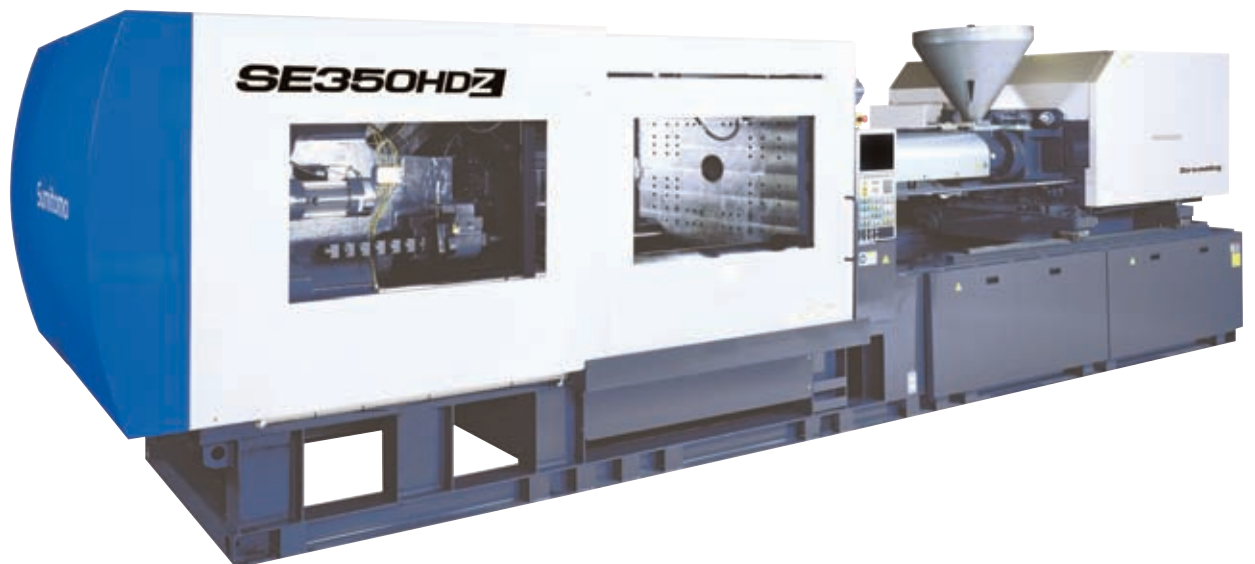


SE-HDZ High-Duty All-Electric Series



## SE-HDZ Series High-Duty All-Electrics



The mid-sized SE-HDZ Series all-electric injection molding machines, available in model sizes from 242 to 496 US tons, were designed for high-duty applications such as thick parts and parts with cycle times in excess of 15 seconds.

With the SE-HDZ, you'll find high hold pressures, up to 31,718 psi, that exactly match the injection pressures. For large part molding, there are also high injection capacities, up to 75% greater than a typical machine. Equipped to deliver full power for up to 40% of the cycle, this machine series ensures exceptional stability, outstanding machine durability and the ability to handle even the toughest high-duty application.

The SE-HDZ features four, Sumitomo AC servo motors with full closed-loop control. All four motions — plasticizing, injection, clamping and ejection — are controlled by these motors. Using highly energy efficient servo motors, the SE-HDZ draws power only as needed and provides significant, quantifiable energy savings. Demand on cooling systems and expenditures related to hydraulic oil and filters, oil clean-up and disposal are reduced.

At the heart of the SE-HDZ is a powerful PC-based control with Z-molding capabilities (See page at far right). Z-molding's three innovative systems help molders avoid errors, reduce costs, optimize machine performance and improve overall productivity.

### The Injection Unit

The SE-HDZ injection unit uses two Sumitomo AC servo motors with full closed-loop control and digital sensors.

Developed for high-duty applications, the injection motor provides the ability to consistently maintain very high hold pressure for an extended period of time — an important factor for avoiding sink marks and improving dimensional stability on thick-wall parts. This servo motor uses a load cell to provide feedback that dictates the speed and torque required for precision injection, hold pressure and back pressure.

The high-duty screw drive motor enables plasticizing at a lower temperature, preventing problems such as material burning and black spot and improving cycle time through decreased cooling time.

Sumitomo's extensive experience in designing and manufacturing electric motors ensures that each machine configuration has the absolute best combination of motors to ensure superior performance while keeping the machine reasonably sized and priced. The SE220HDZ, for example, employs Sumitomo direct-drive motor technology for injection and screw rotation. The SE450HDZ is equipped with high-capacity belted motors, and the motor for injection uses two, large-load capacity ball screws to ensure highly efficient power transmission and outstanding durability.

Another SE-HDZ benefit is increased injection capacity for large parts. On the SE280HDZ, for example, the injection capacity ranges up to 76.1 in<sup>3</sup> (42.2 oz.), a significant increase over comparably sized models.

Raising the bar for precision molding, the Z-molding Flow Front Control (FFC) System (See page at right), delivers improved precision with low-pressure filling. Plus, 10 modes or ramps of filling speed and hold pressure response allow the operator to precisely set the plasticizing acceleration and deceleration response.

Unerring injection velocity control from low to high speeds, and exceptional velocity response, are provided by the use of direct digital control with digital sensors that do not require conversion to analog. Programmable ramping of the velocity and excellent linearity from low- to high-range velocities allow precision molding of diverse applications.

Programmable switchover from velocity to hold delivers precision filling of the cavity. Programmable hold pressure is settable and accurate to within 1kgf/cm<sup>2</sup> from 0 to the maximum hold pressure.

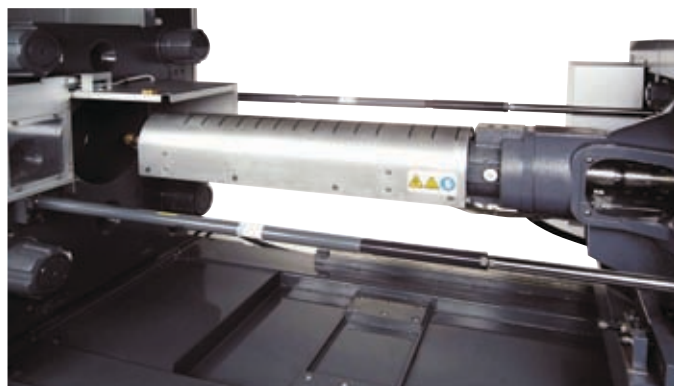
Flash Speed Mode provides fast response control of velocity and pressure to prevent short shots and warp. Synchronized Plasticizing Mode, for low viscosity resins, optimizes control of screw position and back pressure, ensuring plasticizing stability.

PID temperature control provides 2-second sampling and 0.1°C settable barrel zones. An internal resin temperature monitor and inline, needle-type nozzle shut-off are available as options for optimum control of the melt and high-precision shot control.



### SD and SM Screws

The SD screw (standard) is designed to ensure the stability of the melt, delivering consistent quality and improved yield. The patent pending SM screw (optional) provides low shear plasticizing and thorough mixing at low temperatures. Additionally, due to the lower temperature and reduced cooling time, this screw can reduce cycle time. Both screws are also offered in various optional wear resistance grades and with plating.

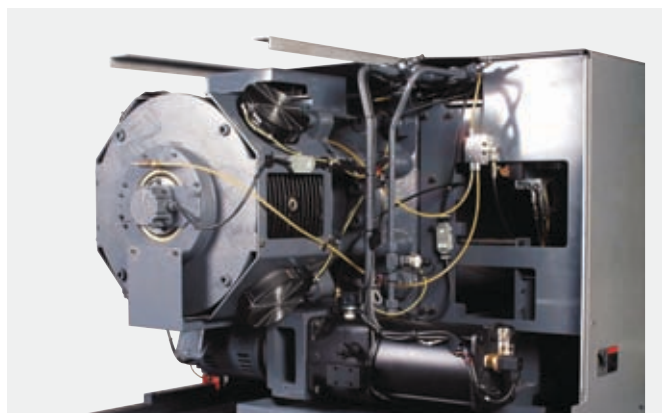


### High-Contact-Force (Nozzle Touch) System

The SE-HDZ's twin-cylinder, high-contact-force system provides significant advantages over lower contact-force systems:

- High force (6.61 tons) comparable to that of a hydraulic clamp machine for high-precision control under high injection pressures
- Dual pull-in rods design for protection of molds and sprue bushings
- Exceptionally fast pressurization/depressurization of 0.3 seconds for faster cycle times. (Typical times range from 0.6 to 1.0 seconds and thus this feature can reduce cycle time by up to 1.4 seconds.)

Additionally, the nozzle touch can be remotely preset to 4.4, 5.5 or 6.6 tons to ensure compatibility with cold runners, hot runners and floating sprue bushings.



### Sealed HST System

To achieve the high nozzle contact force and fast pressurization/depressurization, the SE-HDZ is equipped with a proprietary, sealed Hydrostatic Transmission (HST) system.



The SE-HDZ is equipped with an easy-to-use PC-based control with Z-molding capabilities. Z-molding provides exceptional molding precision with low-pressure filling and reduced clamp force. By shifting the focus to low-pressure filling and reduced clamp force, molders can achieve combined benefits in precision, part cost and overall productivity.

Designed to help molders achieve zero-defect molding and optimum machine performance, Z-molding combines three unique systems.

### Simple Process Setting (SPS) System

The Simple Process Setting (SPS) System allows easy setup and operation while helping the operator avoid oversights and mistakes. Key advantages of the SPS System include:

- Settings are arranged by process from the operator's point of view
- One Process = One Screen
- SPS reduces screen switching for mold setup and purging by 68%
- Avoiding operator error reduces part quality problems, mold damage and scrap

### Patent Pending Flow Front Control System

The Flow Front Control (FFC) System optimizes the flow front, further allowing control of low internal pressures inside the cavities. This system:

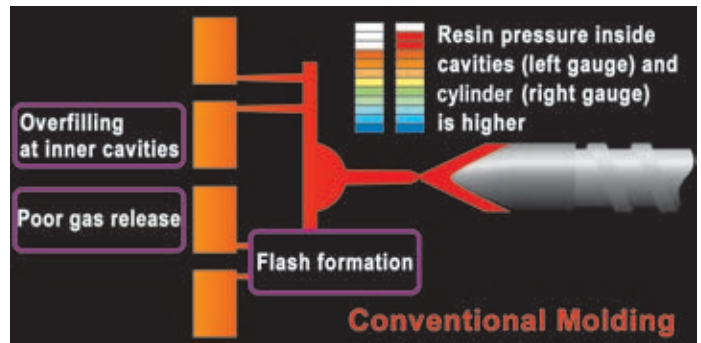
- Takes advantage of the viscoelastic properties of the resin and allows complete filling without flash
- Provides precision control of screw position to ensure consistent filling
- Avoids overfilling, allowing gases to be released and preventing short shots

### Minimum Clamping Molding (MCM) System

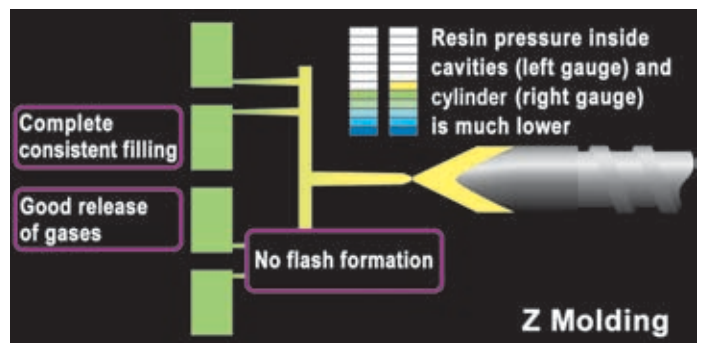
Precision clamp force detection and the feedback control capabilities of the MCM System determine the minimum force required at mold touch. The MCM also works together with the Clamp Force Correcting System to compensate for the thermal expansion of the mold.

Benefits of the MCM System include:

- Avoidance of burn spots and short shots
- Less trapped gases reduces mold maintenance
- Lower clamp force can also reduce power consumption, improve cycle time and in some cases allow molds to be run on lower tonnage machines



In conventional molding, by fully charging resin into mold cavities, overfilling and compression occur at the inner cavities and gasses are trapped.



In Z-molding, the FFC System restricts screw position to optimize the flow front.



## The Clamping Unit

For clamping, the SE-HDZ provides the high-performance combination of Sumitomo's advanced servo motor technology with the company's field-proven, double toggle clamp design. The result is mold open/close operation that's remarkably fast, smooth, precise and energy efficient.

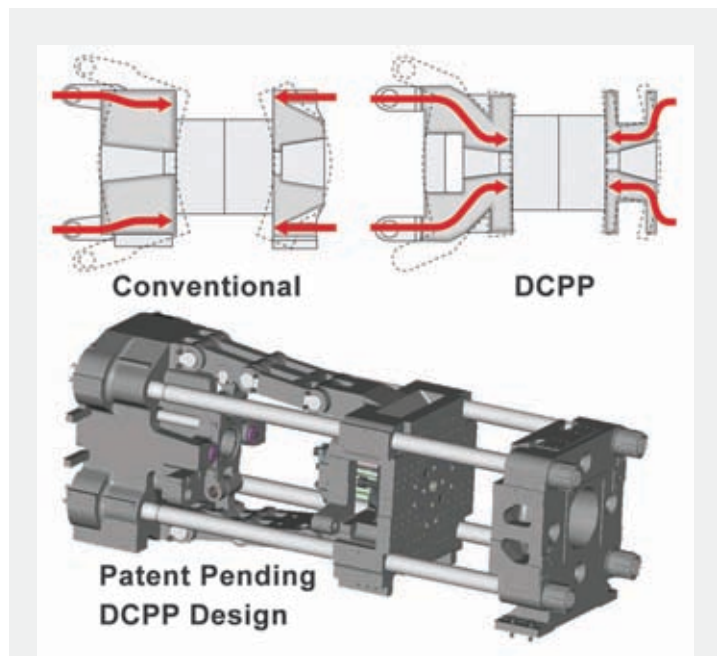
Added to that is the Z-molding Minimum Clamping Molding (MCM) System (inside right hand page) which helps avoid flash, burn spots and shorts shots, and can reduce mold wear, cycle time and power consumption.

The motors used for clamping and ejection on the SE-HDZ are digitally controlled AC servo motors. Precision clamping is assured by full, closed-loop control of mold open/close velocity and position.

To enable fast cycling, mold open/close speeds are 51.2 in/sec (1300 mm/sec) for the 220 through 350 models and 45.9 in/sec (1167 mm/sec) for the 450.

Five-stage mold open/close speed control and ramping allow optimization of mold open/close profiles for fast cycles with shock-free movement plus reduced cycles for 3-plate and slide-core molds.

Precision mold height adjustment is provided by a highly precise rotary encoder. Other features supporting mold changeovers include: increased distance between tie bars, digital-remote clamp force adjustment, increased space for tie-in of ejector rods and a selectable nozzle position for purging.



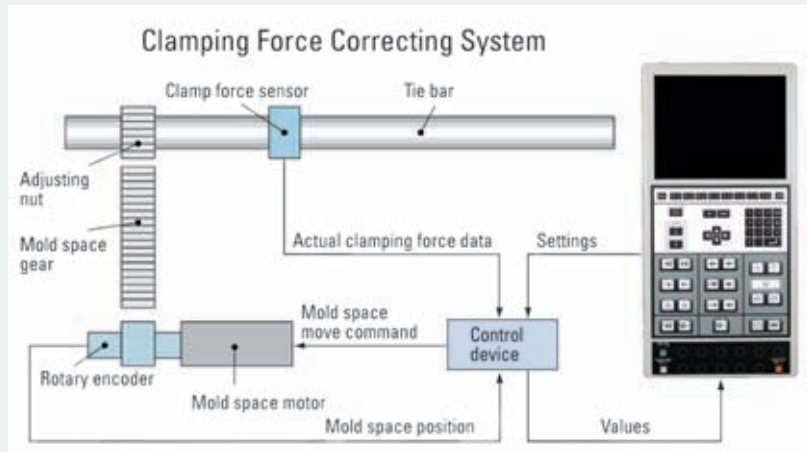
### Double Center Press Platen (DCPP)

The DCCP design of the SE-HDZ Series combines high rigidity with uniform distribution of clamping force, ensuring superior surface pressure balance. Benefits include: reduction of platen deflection, prevention of flash and short shots, improved protection of core pins and extended service life of molds.

Additionally, due to the even surface force distribution, clamping force required can be reduced by up to 20%. This feature, combined with the extra wide platens and high injection capacities, can in many cases allow molds to be run on smaller machines.

## The Sumitomo (SHI) Demag Difference

- Sumitomo's advanced motor technology and the company's ability to design and build specialized motors for injection molding machines, ensuring the best combination of motors for the machine type, function and size
- Over 20 years of R&D on all-electric injection molding machines
- A successful track record of breakthrough technologies that improve precision and productivity
- Z-molding capabilities which ensure ease of use, optimize machine performance and redefine precision
- A standard-setting warranty program and highly rated training, service, support and parts availability



### Patent Pending Feedback System for Clamp Force Control

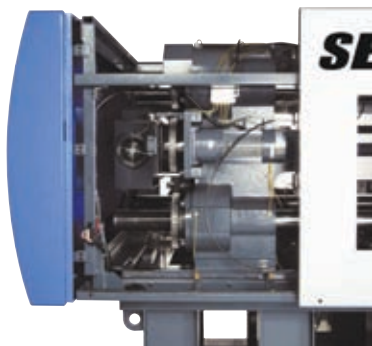
The SE-HDZ is equipped with a unique clamp force correcting system that uses a sensor on the tie bar (strain gauge) that measures actual clamp tonnage.

Unlike systems that rely solely on measurement of the mold space, this system compensates for thermal expansion of the mold. Working together with a control device and high precision rotary encoder, this patent pending system keeps clamping force constantly stable.

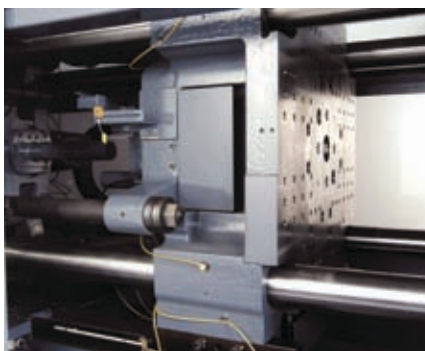
Multi-toggle clamp force control, a standard feature of the SE-HDZ, offers two modes:

- A high-cycle mode in which filling begins during clamping for improved cycle time
- A gas-release mode in which filling begins during low-pressure clamping for improved part quality

For optimum life of the ball screws, toggle pins and tie bar bushings, the SE-HDZ is equipped with a highly reliable, automatic grease supply through a valve-type progressive distribution system. This system uses an externally mounted pump unit with convenient and easy-to-load grease cartridges that can be changed without interrupting machine operation. Additionally, the grease level is monitored via sensor, and the machine shuts down automatically if the grease level becomes too low.



Sliding clamp gate



Shoe-type moving platen supports



Easy access for ejector rod tie-in

For additional information on the SE-HDZ Series, including complete specifications, please consult your Sumitomo (SHI) Demag Sales Representative or visit our website at the address below.



[www.sumitomo-shi-demag.us](http://www.sumitomo-shi-demag.us)

**Norcross:** 1266 Oakbrook Dr., Norcross, GA 30093 Tel: 678.892.7900

**Strongsville:** 11792 Alameda Dr., Strongsville, OH 44149 Tel: 866.491.1045